

DfE Seminarium

RISE & Prodelox

East Sweden Innovation Week
8/11 2022

Vilka är vi?

JOHANNA GUSTAVSSON **Prodelox**

- Utvecklingsingenjör
- Master inom teknisk design & miljödriven produktutveckling
- Exjobb om cirkulär ekonomi

TOMAS WESTLUND **RISE**

- Projektledare på enheten för AI & IoT
- Jobbat 30 år med elektronik- och produktutveckling

VAD SKA VI PRATA OM **IDAG?**

Cirkulär ekonomi,
vad är det?



Påverkan av
produktdesign



Ecodesign
metoder



Konkreta tips
att ta med i sin
utveckling



Vikten av att
mäta



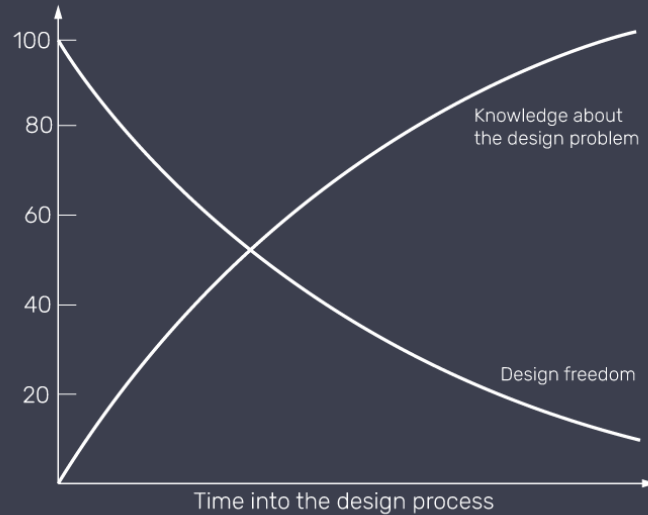
DfE – en modell
att använda
redan idag



Frågor



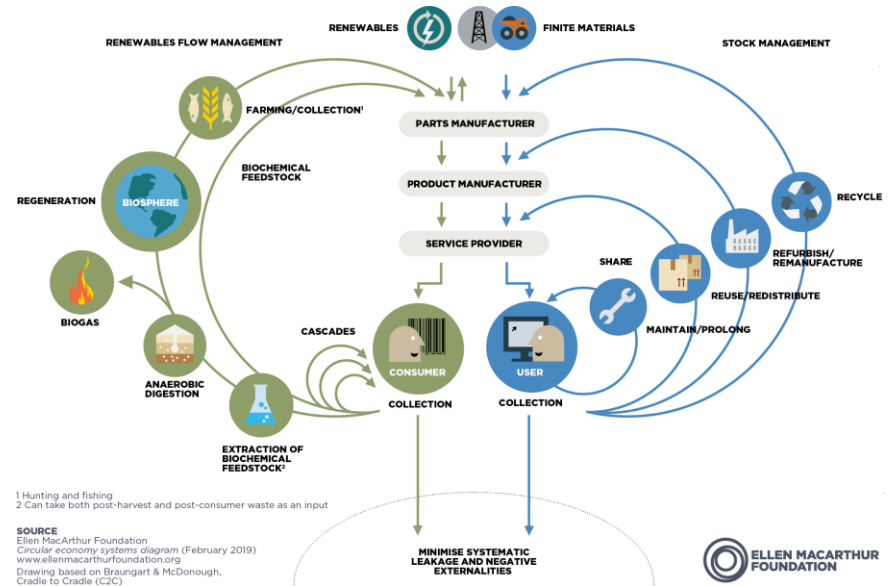
“80% av klimatpåverkan av en produkt bestäms i tidiga designsteg” - EU Parlamentet



Se källa 1 på sista sidan

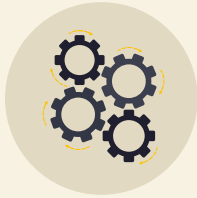
CIRKULÄR EKONOMI

- Avfall ses som en resurs
 - Förlänga användarfasen
 - Circular Economy Action Plan
- Kvalitet och återanvändbarhet
 - Tillverka för återtillverkning
 - Öka återvunnet materialinnehåll
 - Motverka för tidigt åldrande hos produkter
- Stor påverkan under användarfasen



ECODESIGN

"DO MORE WITH LESS"



DESIGN FOR X

- Började som Design for Manufacturing för att återföra krav från fabriken till början av processen.
- Nu: Design for Disassembly eller Remanufacturing exempelvis



Exempel: Scandi-Toner

- Återtillverkar tonerkassetter genom en industriprocess
- Ta ansvar för att "loopa" era produkter innan någon annan gör det.

ECODESIGN

"DO MORE WITH LESS"



ANVÄNDARDRIVEN PRODUKTUTVECKLING

- Används faktiskt produkten på rätt sätt?
- En omtyckt produkt tas om hand bättre



BYGGA MODULÄRT

- Byta ut delar istället för hela
- Förlänga "ny-känslan" och möjlighet till att "personifiera" sin produkt

KONKRETA TIPS

TA TID I DESIGNFASEN

Behövs engagemang
uppifrån

TA IN ANVÄNDARE

Fungerar produkten så
bra som vi tror?

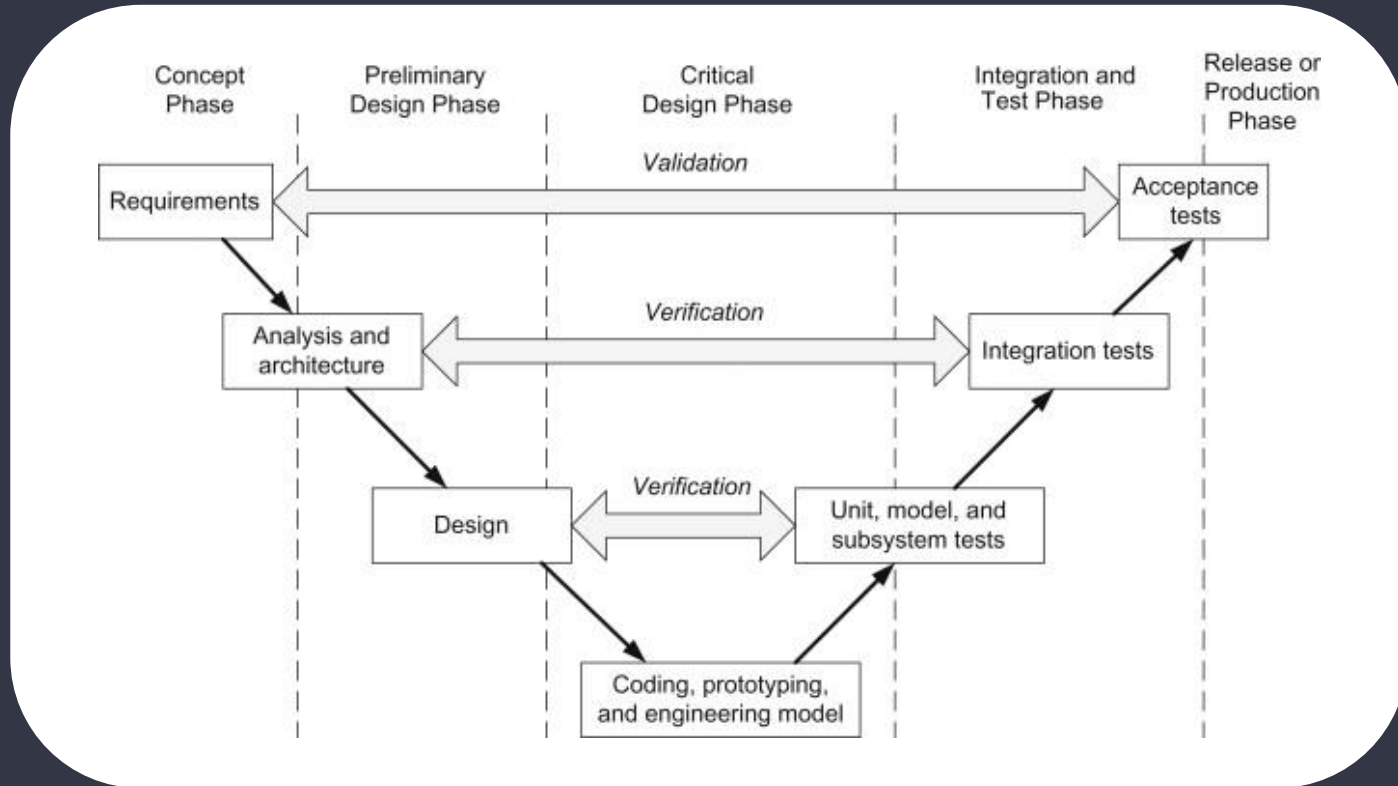
SE ÖVER MILJÖPOLICY

Behöver inkludera produkterna,
inte bara samåkning och
kontorets återvinning.

INTEGRERA RUTINER

Metoder och rutiner kan
behövas för att identifiera
förändringspunkter

En enkel produktutvecklingsmodell



PRODUKTUTVECKLING

STYRS AV MÄTBARA MÅL

Produktprestanda

- 0-100 km/h på under 3 s
- Max 2,5 W
effektförbrukning
- 10 års batteritid

Ekonomiska mål

- Kosta max 300 kr att
tillverka
- Projektet får inte kosta mer
än 10 MSEK

Tidmål

- Redo för lansering 2023-
11-01 (årets julklapp?)

... och just det, gör den lite klimatsmart också...

“ATT MÄTA ÄR ATT VETA”

Mätbara mål ger möjlighet till kontinuerlig uppföljning. Därmed kommer mätbara mål alltid få högre prioritet än omätbara mål.

Men går det att mäta hur bra miljöprestanda en produkt har?

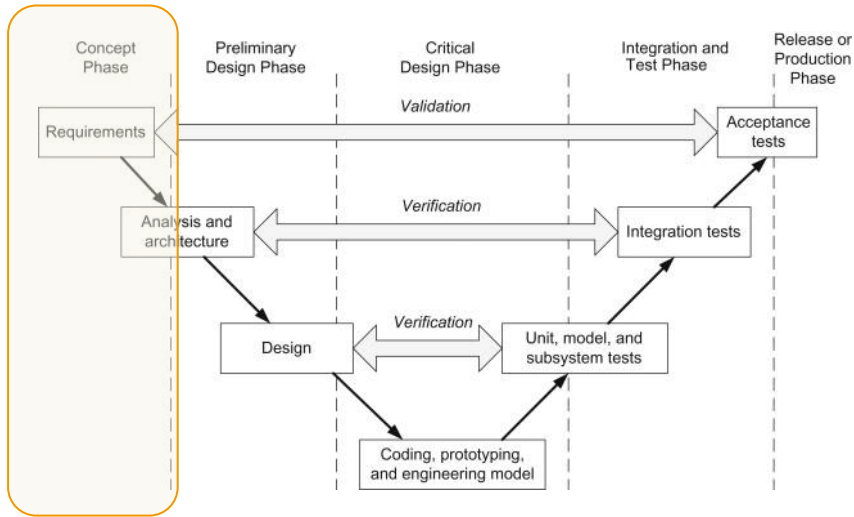


DfE Score Calculator

- Olika aspekter bedöms mot tidigare produkter, eller mot "state-of-the-art"
- Enkel bedömning: Bättre, sämre eller lika?
- Resultat i form av en procentsats 0-100%
- Frågorna är hämtade från The Global Development Research Center (GDRC)

DFE Score Calculator					
Ver 1.1 2022-09-26 TW					
				Score	
				79%	76%
1. Materials, and extraction					
Guideline	Reason	Compliance Requirement stage	Compliance Architectural stage	Compliance finished product	Remarks
Avoid or minimise use of hazardous, toxic or in any other way environmentally unfriendly materials.	Decrease toxic and/or hazardous emissions in later life stages and/or decrease harmful emissions during production	On par	Exceeds	On par	
Avoid materials with a high energy content (Aluminium)	Decrease the amount of energy used during extraction and/or production	Exceeds	Exceeds	Exceeds	
Use materials which are renewable, recyclable and/or recycled, minimise use of thermosets or mixed polymers.	Decrease the amount of non-renewable materials to be extracted from the earth	On par	Exceeds	On par	
Design products in a way that reduces material use, use better design instead of over-dimensioning	Decrease the amount of materials to be extracted from the earth	Exceeds	Exceeds	Exceeds	
Design for minimum waste production during production	Decrease amount of material wasted during production	Exceeds	Exceeds	Exceeds	
Minimise number of materials used	Increase recyclability and ease the sorting process	Exceeds	On par	Below	Metal filter needed to avoid regular replacement
2. Use					
Guideline	Reason	Compliance Requirement stage	Compliance Architectural stage	Compliance finished product	Remarks
Minimise energy consumption during use by: 1. using lowest energy consuming components 2. using default/power down mode 3. the insulation of heating components	Decrease energy consumption during life	Exceeds	Exceeds	Exceeds	
Minimise amount of consumables used during the use stage by: 1. product design e.g. permanent filters instead of paper filters 2. minimise leakage, e.g. by installing a leak detector 3. reusing consumables, e.g. reuse water from washing facilities to flush toilets 4. clear instructions to prevent misuse, e.g. by providing instructions on the product itself 5. product design to prevent spillage, e.g. provide instructions on how often a product, such as filter cartridges, should be replaced, or by designing the filling inlet large enough to prevent spilling 6. use of calibration marks to restrict required amounts of consumables, e.g. dosage for laundry detergents 7. product design that stimulates sustainable behaviour, e.g. only reusable cups and no disposable cups provided at drinks dispenser or double sides copies default option	Decrease the amount consumables used by a product during its life	On par	Below	On par	Architectural stage: Consumable plastic filter deemed necessary finished product stage: Plastic filter replaced by permanent metal filter
Optimise life time of product by increasing reliability and durability	Decrease need for new products, hence decrease material and energy use for production	Below	Below	Below	Increase life time would require use of more raw material and material with higher energy consumption
Design for easier maintenance and repair by: 1. indicate opening instructions for cleaning and/or repair 2. indicate parts for maintaining by colour codes 3. make location of wear detectable on parts 4. make vulnerable parts easy to dismantle and replace	Increase life span of a product by easier repair and maintenance	Exceeds	Exceeds	Exceeds	

Låt oss prova!



DSE Score Calculator

Item	Weight	Score			
		1	2	3	4
1. Methods, and strategies					
1.1. The project team has a clear understanding of the project goals and objectives.	10	2	3	4	
1.2. The project team has a clear understanding of the project risks and challenges.	10	2	3	4	
1.3. The project team has a clear understanding of the project resources and constraints.	10	2	3	4	
1.4. The project team has a clear understanding of the project stakeholders and their interests.	10	2	3	4	
1.5. The project team has a clear understanding of the project communication and reporting requirements.	10	2	3	4	
2. Risk					
2.1. The project team has a clear understanding of the project risks and challenges.	10	2	3	4	
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2.3. The project team has a clear understanding of the project stakeholders and their interests.	10	2	3	4	
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2.12. The project team has a clear understanding of the project resources and constraints.	10	2	3	4	
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2.17. The project team has a clear understanding of the project resources and constraints.	10	2	3	4	
2.18. The project team has a clear understanding of the project stakeholders and their interests.	10	2	3	4	
2.19. The project team has a clear understanding of the project communication and reporting requirements.	10	2	3	4	
2.20. The project team has a clear understanding of the project goals and objectives.	10	2	3	4	

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Exempel med tre uppföljningar

Sammanfattning

- Miljöprestanda är i allt högre utsträckning en konkurrensfördel
- För att styra mot ständigt förbättrad miljöprestanda behöver denna mätas i hela produktutvecklingscykeln
- Det finns enkla metoder som kan införas i den befintliga produktutvecklingsprocessen

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Frågor?

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Hör gärna av er!

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Referenser

Här är länkar till studier som används som källor i presentationen:

1. European Commission, 2020, "Circular Economy Action Plan", I: *The computer journal*
2. Ellen MacArthur Foundation, "Circular Economy systems diagram", 2019, www.ellenmacarthurfoundation.org, Hämtad: 2022-11-07
3. Rossi, Marta, Michele Germani, och Alessandra Zamagni, 2016, "Review of ecodesign methods and tools. Barriers and strategies for an effective implementation in industrial companies". I: *Journal of Cleaner Production* 129
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5. Haines-Gadd, Merryn, Jonathan Chapman, Peter Lloyd, Jon Mason, and Dzmitry Aliakseyeu, 2018, "Emotional Durability Design Nine—A Tool for Product Longevity". In: *Sustainability* 10.6.
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7. The Global Development Research Center, 2020-2025, gdrc.org, Hämtad: 2022-11-07